Source Water Assessment Program (SWAP) Report for Wales Elementary School

What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- Inventory land uses within the recharge areas of all public water supply sources;
- Assess the susceptibility of drinking water sources to contamination from these land uses; and
- Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the Massachusetts Department of Environmental Protection, Bureau of Resource Protection, Drinking Water Program

Date Prepared:
May 31, 2001

Table 1: Public Water System (PWS) Information

PWS Name	**Wales Elementary School**
PWS Address	**41 Main Street, State Route 19**
City/Town	**Wales, Massachusetts**
PWS ID Number	**1306004**
Local Contact	**Ms. Rosemary Joseph, Superintendent**
Phone Number	**508-347-3077**

Well Name	*Source ID#*	*Zone I (in feet)*	*IWPA (in feet)*	*Source Susceptibility*
Well 1	1306004-01G	140	442	High

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:
This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:
1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. Description of the Water System

Wales Elementary School, an elementary school with a total staff and student population of approximately 230 people, is located immediately on the west side of Main Street, State Route 19 in the center of Wales, a rural, residential setting. Well 1 is the sole source of water for the school and is on the northeast side of the school, within 12 feet of the school wall. The Zone I protective radius for Well 1 is 121 feet and the Interim Wellhead Protection Area (IWPA) radius is 430 feet. The protective radii were based on metered usage for the two highest months on record. Please refer to the attached map that shows the Zone I and IWPA. The Zone I is the area immediately around the wellhead while the IWPA is a larger area that likely contributes water to the wellhead. The IWPA is only an interim protection area; the actual area of contribution to the wellhead may be larger or smaller. The actual recharge area for the Wales Elementary

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by **the** water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

School well is likely larger than the mapped IWPA, at least in the northeasterly direction. A confirmed hazardous materials release site located at 12 Haynes Hill, has been identified by the DEP as the source of volatile organic compounds reported in the school water supply as well as several other private wells in the immediate vicinity. That location is outside of the mapped IWPA.

Well 1, a 6-inch diameter well, is reportedly drilled to a final depth of approximately 240 feet. The well is located in a 5-foot deep pit, with a locking bulkhead cover; the wellhead extends approximately 4 feet above the bottom of the pit. A drain was installed to prevent flooding of the pit. There is no record of final construction of the well or of the materials encountered during drilling. Geologic mapping of the area indicates the overburden material at the school consists of undifferentiated sand and gravel deposits but does not indicate the depth of the deposits. Because of the depth of the well, it is assumed to be a bedrock well. The bedrock is mapped as quartzofeldspathic gneiss and sillimanite schist, the upper schist member, of the Hamilton Reservoir Formation. Bedrock wells drilled in these conditions are considered to be highly vulnerable to potential contamination from the ground surface because there is no significant barrier to prevent surface contamination from migrating into the bedrock aquifer.

Water Quality

The Wales Elementary School well water is treated for removal of volatile organic compounds and disinfected prior to distribution. In 1997, 1,1-Dichloroethylene and trichloroethylene (TCE) were reported in the water supply at the school. MA DEP conducted an investigation, which identified a source location of a TCE release that also impacted several private wells initiating a "clean-up" at the release site. The water at the school is treated and filtered to remove naturally occurring iron and manganese and then passes through granular activated carbon adsorption filters to remove the volatile organic compounds then is disinfected by an ultraviolet disinfection unit. The sediment filter backwash water is stored in a tight tank that is pumped out approximately once per month. For current information on monitoring results, please refer questions to the water supply contact listed above in Table 1. For further information on the status of the release site, refer to the information in Appendix A and contact the Bureau of Waste Site Cleanup (BWSC) at 413-784-1100 about Tier 1B site Release Tracking Number (RTN – 1-11899).

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Sources of Contamination*	Zone I	IWPA	Threat	Comments
Confirmed hazardous materials/oil release site, septic system	No	No	**	Tier 1B - RTN 1-11899 disposal of TCE through septic system (see Appendix A)
Fuel Storage Below Ground (UST)	Yes	No	High	Underground heating oil tank
Auto repair/body shop (Very Small Quantity Generator – VSQG)	No	Yes	High	Petroleum products use and storage
Septic tank & Tight tank	No	Yes	Moderate	See septic systems brochure in the attachments
Low density residential w/septic	No	Yes	Moderate	See septic system/pesticide attachments
Floor drain	Yes	No	Moderate	Boiler room
School Structures, athletic fields Parking lot & roads	Yes	Yes	Moderate	Fertilizer and pesticide usage. Road salt and disposal of household type hazardous waste

*** -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/. ** See Appendix A**

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400-foot to ½-mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone II. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material, such as clay, that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

2. Discussion of Land Uses in the Protection Areas

Several land uses and activities within the drinking water supply protection areas are potential sources of contamination.

Key issues include:

1. **Non-conforming Activities in Zone I**
2. **Confirmed Release Site RTN 1-11899**
3. **An Underground Fuel Oil Storage Tank in Zone I**
4. **Auto Repair/Body Shop**
5. **Floor drain in boiler room**

The overall ranking of susceptibility to contamination for the well is high, based on the presence of at least one high and several moderately ranked land uses or activities in the IWPA, as seen in Table 2.

1. Non-conforming activities in Zone I – Currently, the well does not meet DEP's restrictions that allow only water supply related activities in Zone I. The facility's Zone I contains school buildings, roads, parking areas, and property owned by an auto repair and autobody repair facility. The public water supplier does not own all land encompassed by the Zone 1 and therefore has no control over some of the activities. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

Recommendations:

- ✓ Do not conduct any new activities within Zone I.
- ✓ Do not use or store pesticides, fertilizers or deicing materials within the Zone I.
- ✓ If the existing threats cannot be mitigated, and pose increased threat, consider investigating an alternative site for a new well.

2. Confirmed Release Site RTN 1-11899 – The location identified by the DEP as the source of the TCE impacting the school well as well as several other nearby wells was a residential septic system through which solvents were improperly disposed of. The site 12 Haynes Hill Road is located approximately 2,300 feet from the school.

Recommendation:

- ✓ For complete information regarding this site, contact the DEP BWSC and ask about Tier 1B site RTN 1-11899. Periodically monitor the status of the site.

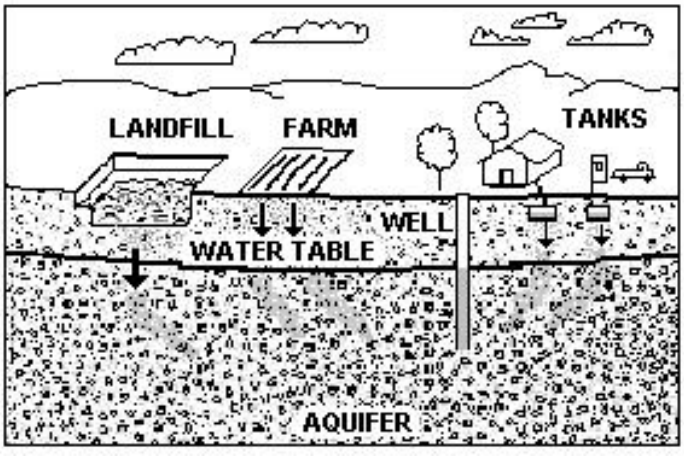

Figure 1: Example of how a well could become contaminated by different land uses and activities.

3. Underground Fuel Oil Storage Tank (UST) – The fuel oil storage tank was replaced in 1994 in compliance with current requirements for double wall construction and leak detection. An UST in the Zone I containing petroleum products is a concern due to the potential threat posed by a release of large quantities of fuel.

Recommendations:

- ✓ Closely monitor activities associated with the fuel tank refilling and usage.
- ✓ Any further modifications to the UST must be accomplished in a manner consistent with Massachusetts's plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding USTs.

4. Auto Repair/Body Shop - Part of the Zone I extends to the adjacent property, which is an auto body shop. The potential threats are from petroleum products, solvents and paints stored and used on site as well as the vehicles parked on site. Proper management of hazardous materials

For More Information:

Contact Catherine V. Skiba in DEP's Springfield Regional Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at: www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the public water supplier, town boards, the town library and the local media.

minimizes the threat from commercial activities. Currently, there is no evidence indicating adverse environmental impact from this facility. The facility is a registered Very Small Quantity Generator of Hazardous Waste (VSQG) – MAV000015464.

Recommendations:

- ✓ Maintain communication with the business owner and support their efforts to use Best Management Practices for the handling of hazardous materials and salvage vehicles.

6. Floor Drain - The floor drain in the boiler room may be required to protect the school from accidental plumbing failure. Title 5 prohibits disposal of any wastewater other than sanitary waste to a septic system and requires other discharges to go either to a tight tank or to a sanitary sewer. There is no sanitary sewer available in Wales. Therefore, the floor drain must be protected to prevent discharges through the floor drain such as boiler blowdown or accidental release of oil during maintenance. There are no hazardous materials stored in the boiler room and an outside contractor maintains the boiler.

Recommendations:

- ✓ Oil lines from the tank to the boiler can be sleeved so that any oil line leaks would drain back to the tank or minimal oil would leak to the boiler room. A policy and plan should be in place during maintenance operations, especially when oil filters are changed. We recommend that you require your boiler maintenance contractor to use containment, protect the drain and have absorbent materials on hand to prevent accidental leaks while conducting routine maintenance. The contractor should be responsible for the off-site disposal of any boiler blowdown generated during maintenance.

Other activities noted during the assessments were parking, roadways and storm water catch basins. Catch basins transport storm water from the roadway and adjacent properties to the ground. As flowing storm water travels, it picks up debris and contaminants from streets, parking areas and lawns. Common potential contaminants include lawn chemicals, pet waste, leakage from dumpsters, household hazardous waste, and contaminants from vehicle leaks, maintenance, washing or accidents. Work with the Town to have to the catch basins maintained and cleaned. In addition, residential homes surround the school. Residential homes pose minimal threat to public and private water supplies provided home owners use Best Management Practices with respect to septic system maintenance and disposal practices, household hazardous waste, auto car and lawn and pest control. Work with your community to continue providing information regarding the use of Best Management Practices. The DEP can provide your community with information on how to develop public outreach and support local protection measures.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. The staff of the Wales Elementary School is commended for their current attention to detail regarding the treatment unit and protection measures. The Wales Elementary School in conjunction with the district and local officials should review and adopt the key recommendations above and the following:

Zone I and IWPA:

- ✓ Keep any new non-water supply activities out of the Zone I.
- ✓ Maintain the tight tank as appropriate.
- ✓ Post drinking water protection area signs at key visibility locations.
- ✓ Monitor all non-compliant activities in the Zone I.
- ✓ Consider well relocation if Zone I threats cannot be mitigated.

- ✓ Prohibit public access to the well by locking facilities and posting signs.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of vandalism, check area for accidental spills and leaks, etc.
- ✓ Maintain road and parking lot drainage and catch basins.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Consider raising the wellhead above grade to prevent flooding of the wellhead.

Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, certified operator, and food preparation staff. Post labels as appropriate on raw materials and hazardous materials.
- ✓ Incorporate groundwater education into school curriculum (K-6 curricula available; contact DEP for copies or other references).
- ✓ Work with your community to ensure that stormwater runoff is directed away from the well and is treated according to DEP guidance.

Facilities Management:

- ✓ Monitor water quality from the treatment unit regularly to determine efficiency of the treatment. Conduct diligent maintenance on the units and recommend alternative treatment as required to maintain water quality.
- ✓ Prohibit non-sanitary wastewater discharges to on-site septic systems. Post sinks as appropriate.
- ✓ Do not store any hazardous materials in rooms with floor drains that drain to the ground or septic systems.
- ✓ Generally there is little use of hazardous materials in an elementary school. However, periodically during cleaning or maintenance, household hazardous waste is generated. Contact the Massachusetts Office of Technical Assistance at 617-626-1061 regarding proper hazardous material use, storage, disposal, emergency response, and best management practices. Develop a procedure for storage and disposal of any hazardous materials either through the Town's hazardous waste collection days or through other appropriate means. Make the process simple to ensure participation of all appropriate custodial staff. The school will have to register as a Very Small Generator of Hazardous Waste to dispose of small quantities of hazardous materials. Include custodial staff, groundskeepers, certified operator, and food preparation staff in the training.
- ✓ Implement Best Management Practices (BMPs) for the use of pesticides on facility property.
- ✓ Septic system components should be inspected, and maintained on a regular basis. Refer to the appendices for more information regarding septic systems.
- ✓ Wellheads should be raised above grade to prevent accidental flooding of the well.
- ✓ Concrete wellhead protective pads should slope away from well and well casing should extend above ground.
- ✓ For utility transformers, including pole mounted transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. If PCBs are present, urge their immediate replacement. Contact the utility if the area near the transformer has tree limbs that could endanger the transformer in a storm.

Planning:

- ✓ Work with local officials in Wales to encourage the development of and implementation of Aquifer Protection Bylaws that would include the school's IWPA. The Department can assist your community in developing wellhead protection bylaws.
- ✓ Review and update as appropriate, your plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.

Funding:

The Department's Wellhead Grant Protection Program provides funds to assist public water suppliers address Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the Wellhead Protection Grant or the Source Water Protection Technical Assistance/Land Management Grant Program. For additional information, please refer to the attached program fact sheet. Please note that each year the program is funded, the Department posts a new Request for Response (RFR – grant application form) for the Grant programs on the internet on or about May 1; the due date is generally on or about June 30. Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

4. Attachments

- Making Wellhead Protection Work in Massachusetts
- Preparing a Wellhead Protection Plan
- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Fact Sheet
- Your Septic System Brochure
- Pesticide Use Fact Sheet
- Healthy Schools Fact Sheet
- Wellhead Protection Grant Program Fact Sheet
- Source Protection Sign Order Form

5. Appendices

1. APPENDIX 1 – Table of Tier Classified Oil and/or Hazardous Material Sites

APPENDIX 1
Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Sites Within or Proximal to Wellhead Protection Areas

DEP's data layer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at http://www.state.ma.us/dep/bwsc. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at http://:www.state.ma.us/dep/bwsc/sitellst.htm, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

RTN	Release Site Address	Tier Classification	Town	Contaminant Type
1-11899	12 Haynes Hill	Tier 1B	Wales	Solvents

For more location information, please see the attached map. The map lists the release sites by RTN.